

**PATENT**

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**  
**BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

In re Application of:	:	Docket: PST 6366 P1US/2187
Martin HELLSTEN et al.	:	
	:	
Serial No.: 10/520,491	:	Group Art Unit: 1762
	:	
Int'l Application No.: PCT/SE2003/001015	:	Examiner: Daniel S. Metzmaier
Int'l Filing Date: June 17, 2003	:	Confirmation Number: 9838
	:	
For: A DRAG-REDUCING AGENT FOR USE	:	
IN INJECTION WATER AT OIL RECOVERY	:	

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

**BRIEF ON APPEAL**

Respectfully submitted,



Ralph J. Mancini  
Attorney for Appellants  
Registration No. 34,054

Akzo Nobel Inc.  
Legal, IP & Compliance  
120 White Plains Road, Suite 300  
Tarrytown, NY 10591  
(914) 333-7454

## TABLE OF CONTENTS

	<u>Page</u>
I. INTRODUCTION-----	3
II. REAL PART IN INTEREST-----	3
III. RELATED APPEALS AND INTERFERENCES-----	4
IV. STATUS OF THE CLAIMS-----	4
V. STATUS OF THE AMENDMENTS-----	4
VI. SUMMARY OF CLAIMED SUBJECT MATTER -----	5
VII. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL-----	10
VIII. ARGUMENT-----	10
IX. CLAIMS APPENDIX-----	18
X. EVIDENCE APPENDIX-----	23
XI. RELATED PROCEEDINGS APPENDIX-----	24

## **PATENT**

### **IN THE UNITED STATES PATENT AND TRADEMARK OFFICE BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

In re Application of:	:	Docket: PST 6366 P1US/2187
Martin HELLSTEN et al.	:	
	:	
	:	Group Art Unit: 1792
Serial No.: 10/520,491	:	
	:	
	:	Examiner: Daniel S. Metzmaier
Int'l Application No.: PCT/SE2003/001015	:	
Int'l Filing Date: June 17, 2003	:	Confirmation Number: 9838
	:	
For: A DRAG-REDUCING AGENT FOR USE	:	
IN INJECTION WATER AT OIL RECOVERY	:	

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

### **Brief on Appeal**

#### **I. INTRODUCTION**

Pursuant to the provisions of 35 U.S.C. §134 and 37 C.F.R. §§1.191 and 1.192, this paper is submitted as a brief setting forth the authorities and arguments upon which Appellants rely in support of the Appeal from the Final Rejection of claims 1-5 and 8-16 and 19-21, entered in the above-identified patent application on January 8, 2010 and maintained in the Advisory Actions mailed July 21, 2010, September 10, 2010 and November 1, 2010, respectively.

*An Appeal Conference is respectfully requested for this case.*

#### **II. REAL PART IN INTEREST**

The real party in interest in the present case is Akzo Nobel nv, Arnhem, The Netherlands.

### **III. RELATED APPEALS AND INTERFERENCES**

There are no related appeals or interferences pending or anticipated involving the present application.

### **IV. STATUS OF THE CLAIMS**

The present application was filed on June 17, 2003 as International Serial No. PCT/SE2003/001015. Claims 1-5 and 8-16 and 19-21 are pending in the application. Claims 1-5 and 8-16 and 19-21 stand rejected and are the subject of this Appeal. Claims 6, 7, 17 and 18 have been canceled.

### **V. STATUS OF THE AMENDMENTS**

An Amendment after final rejection was filed on July 10, 2010. In the Advisory Action mailed July 21, 2010 the examiner refused to enter the proposed amendments alleging that they raised new issues and did not simplify or reduce the issues for Appeal. Appellants disagreed and on August 23, 2010, Appellants filed a Petition Under 37 CFR 1.181 alleging that the examiner improperly refused to enter the claim amendments made in the Amendment filed on July 7, 2010.

On September 10, 2010 the examiner issued a second Advisory Action again refusing to enter the proposed amendments.

On September 16, 2010, the Petition was decided in favor of Appellants and the examiner was directed to consider the amendments consistent with the Decision On Petition.

On November 1, 2010, the examiner issued a third Advisory Action entering the proposed amendments and rejecting same on what Appellants submit is essentially *new grounds*. That has necessitated the filing of the present Appeal Brief with four months extensions of time.

*Appellants' note that the Petition mailed September 16, 2010 held that the examiner improperly refused to enter Appellants' proposed amendments. A new Advisory Action was mailed six weeks later (on Nov. 1) leaving Appellants little time and no attractive option but to file an Appeal Brief by December 8, 2010 with a four month extension of time<sup>1</sup>. After having the proposed amendments improperly denied entry in July, having to file a Petition that was ultimately decided in Appellants' favor in September, and having to wait until November 1, 2010 for action to be taken by the office, such a result seems manifestly unjust (especially having to pay \$1760 in extension fees).*

*It should also be noted that Appellants requested a brief telephone interview with the examiner to discuss i) whether the showing was sufficient for the embodiments tested, and ii) what type of showing the examiner would consider to be commensurate in scope with the claims, but unfortunately the examiner refused to have any substantive discussions regarding this case, even those that might significantly advance prosecution and/or avoid this Appeal.*

## **VI. SUMMARY OF THE CLAIMED SUBJECT MATTER**

The present invention relates to the use of a drag-reducing agent containing a zwitterionic surfactant and an anionic surfactant in waters containing electrolytes. The agent is very efficient at low contents even in waters having a high electrolyte content and is suitable to be utilized in injection waters at oil recovery.

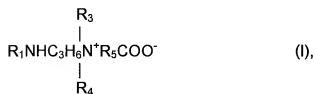
All line and page numbers provided below refer to the published PCT application, PCT/SE2003/001015.

Claim 1 is directed to a drag-reducing agent containing

---

<sup>1</sup> Refiling the present application without knowing if Appellants' showing was sufficient for the embodiments tested, and not knowing what the examiner would consider to be commensurate in scope with the claims was not a realistic option.

a) a zwitterionic surfactant of the formula

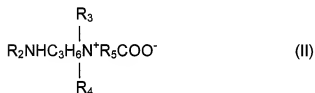


where  $\text{R}_1$  is acyl group with 12-16 carbon atoms,  $\text{R}_3$  and  $\text{R}_4$  are independently of each other an alkyl group of 1-4 carbon atoms or an hydroxyalkyl group of 2-4 carbon atoms and  $\text{R}_5$  is an alkylene group of 1-4 carbon atoms, or a group



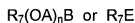
where  $\text{R}_6$  is an alkyl group of 1-3 carbon atoms,

b) a zwitterionic surfactant of the formula



where  $\text{R}_2$  is an acyl group with 18-22 carbon atoms, and  $\text{R}_3$ ,  $\text{R}_4$  and  $\text{R}_5$  have the meanings mentioned above, and

c) an anionic surfactant of the formulae



or a mixture thereof, where  $\text{R}_7$  is an aliphatic group of 8-14 carbon atoms, A is an alkylene group having 2-4 carbon atoms, n is a number from 1 to 10, B is a sulphate group  $\text{OSO}_3\text{M}$ , E is a sulphate group  $\text{OSO}_3\text{M}$  or a sulphonate group  $-\text{SO}_3\text{M}$  and M is a cationic, preferably monovalent group;

the weight of a), b) and c) being 20-95% by weight, 10-70% by weight and 1-50% by weight, respectively, based on the total amount of a), b) and c). (Page 3, starting at line 17 to page 4, line 19).

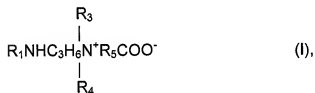
Claim 2 specifies that the drag reducing agent of claim 1 is present in an amount of 20-85% by weight. (Page 5, lines 21-25).

Claim 3 claims that  $R_2$  of said drag reducing agent contains at least 50% by weight of unsaturated acyl groups (original claim 3), while claim 4 specifies that  $R_2$  contains at least 20% by weight of unsaturated acyl groups having two or more double bonds (original claim 4).

Claim 5 provides that the drag reducing agent c) is lauryl sulphate, a lauryl (oxyethylene)<sub>n</sub> sulphate, where n is 1-3, or lauryl sulphonate in the drag reducing agent of claim 1 Page 5, lines 14-20).

Claim 8 claims injection water for the treatment of oil reservoirs, wherein said water contains a drag reducing agent comprising:

a) a zwitterionic surfactant of the formula

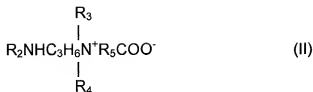


where  $R_1$  is acyl group with 12-16 carbon atoms,  $R_3$  and  $R_4$  are independently of each other an alkyl group of 1-4 carbon atoms or an hydroxyalkyl group of 2-4 carbon atoms and  $R_5$  is an alkylene group of 1-4 carbon atoms, or a group



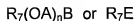
where  $R_6$  is an alkyl group of 1-3 carbon atoms,

b) a zwitterionic surfactant of the formula



where  $\text{R}_2$  is an acyl group with 18-22 carbon atoms, and  $\text{R}_3$ ,  $\text{R}_4$  and  $\text{R}_5$  have the meanings mentioned above, and

c) an anionic surfactant of the formulae

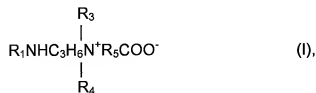


or a mixture thereof, where  $\text{R}_7$  is an aliphatic group of 8-14 carbon atoms, A is an alkylene group having 2-4 carbon atoms, n is a number from 1 to 10, B is a sulphate group  $\text{OSO}_3\text{M}$ , E is a sulphate group  $\text{OSO}_3\text{M}$  or a sulphonate group  $-\text{SO}_3\text{M}$  and M is a cationic, preferably monovalent group; wherein the weights of components a), b) and c) are 20-95% by weight, 10-70% by weight and 1-50% by weight, respectively, based on the total amount of a), b) and c), which is from 50-400 ppm and said water in the absence of said drag reducing agent has an electrolyte content of 0.01-7% by weight (page 6, first paragraph).

Claim 9 specifies that the injection water of claim 8 contains electrolytes in an amount of 0.3-6% by weight, while claim 10 claims that the injection water is sea-water or production water (page 3, lines 5-12).

Claim 11 claims a method of reducing drag in waters containing electrolytes which comprises adding to said waters containing said electrolytes at least one drag-reducing agent containing

a) a zwitterionic surfactant of the formula



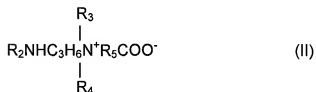


where  $R_1$  is acyl group with 12-16 carbon atoms,  $R_3$  and  $R_4$  are independently of each other an alkyl group of 1-4 carbon atoms or an hydroxyalkyl group of 2-4 carbon atoms and  $R_5$  is an alkylene group of 1-4 carbon atoms, or a group



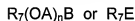
where  $R_6$  is an alkyl group of 1-3 carbon atoms,

b) a zwitterionic surfactant of the formula



where  $R_2$  is an acyl group with 18-22 carbon atoms, and  $R_3$ ,  $R_4$  and  $R_5$  have the meanings mentioned above, and

c) an anionic surfactant of the formulae



or a mixture thereof, where  $R_7$  is an aliphatic group of 8-14 carbon atoms, A is an alkylene group having 2-4 carbon atoms, n is a number from 1 to 10, B is a sulphate group  $OSO_3M$ , E is a sulphate group  $OSO_3M$  or a sulphonate group  $-SO_3M$  and M is a cationic, preferably monovalent group;

the weight of a), b) and c) being 20-95% by weight, 10-70% by weight and 1-50% by weight, respectively, based on the total amount of a), b) and c); wherein the total amount of components a), b) and c) is from 50-400 ppm and said water in the absence of said drag reducing agent has an electrolyte content of 0.01-7% by weight (page 3, lines 5-16).

Claim 12 specifies that components a) and b) are present in an amount of 20-85% by weight and 10-70% by weight, respectively (page 5, line 21-25), while claim 13 specifies that  $R_2$  contains at least 50% by weight of unsaturated acyl groups (original claim 3).

Claim 14 claims that R<sub>2</sub> contains at least 20% by weight of unsaturated acyl groups having two or more double bonds (original claim 4), while in claim 15, it is specified that c) is lauryl sulphate, a lauryl (oxyethylene)<sub>n</sub> sulphate, where n is 1-3, or lauryl sulphonate (page 5, lines 14-20).

Claim 16 specifies that in the method of claim the water has an electrolyte content of 0.3-6% by weight (page 3, lines 5-12).

Claim 19 claims the drag reducing agent claim 1, wherein R<sub>5</sub> is CH<sub>2</sub> (page 3, line 28).

Claim 20 claims the injection water of claim 8, wherein R<sub>5</sub> is CH<sub>2</sub> (page 3, line 28).

Finally, claim 21 claims the method of claim 11, wherein R<sub>5</sub> is CH<sub>2</sub> (page 3, line 28).

## **VII. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL**

In the official action mailed January 8, 2010 the examiner maintained the rejection of claims 1-5 and 8-21 under 35 U.S.C. § 103(a) over Hellsten (U.S. 5,902,784). No other rejections have been applied against the pending claims. Accordingly, the only issue remaining for resolution of Appeal is as follows:

1. Are claims 1-5, 8-16 and 19-21 rendered obvious under 35 U.S.C. § 103(a) by the teachings of Hellsten (U.S. 5,902,784).

## **VIII. ARGUMENT**

In the Final Rejection mailed January 8, 2010, at page 6, line 4, the examiner states that claim 8 does not require component (b). In direct response to those

comments, Appellants combined claims 17 and 18 with claim 8, thereby rendering this point moot.

In **point 9** of the Final Rejection (page 7) the examiner acknowledges that the claimed subject matter is novel, but not deemed to be unobvious.

In the Advisory Action mailed November 1, 2010, the examiner relies on a new reference to Rosen and also relies on new grounds based on Rosen to reject Appellants' claims. Filing a Petition was not an option at this point since it would not toll the time period for filing this Brief. In essence, the examiner alleges, in view of Rosen, that Appellants have not demonstrated synergy commensurate in scope with the claims. Appellants respectfully disagree.

In the first instance, Appellants are not willing to concede that the examiner has, in fact, established a prima facie case of obviousness for the presently claimed invention, including the newly entered claim limitations. In fact, Appellants respectfully submit that the examiner has not established a prima facie case. In this regard, The Honorable Board is respectfully requested to note the substantial differences between Hellsten and the claimed invention.

First, the drag reducing agent of claim 1 is generally disclosed in Hellsten when the amount of component (b) of present claim 1 is 0%. However, in the newly entered amended claims component (b) is not 0%; a minimum of 10% by weight of component b) is now required by Appellants' claims. This is not an insignificant difference.

Additionally, the zwitterionic surfactant of the present invention is of the type  $R_1NHC_3H_6N^+(R_3)(R_4)R_5COO^-$ , where  $R_1$  is an acyl group, not including  $RN^+(CH_3)(CH_3)CH_2COO^-$ , where R is an alkyl group. Further, the zwitterionic surfactant of the present invention has an acyl group with 12-16 carbon atoms, which is also a

selection from 10-24 carbon atoms of Hellsten. Thus, the first zwitterionic surfactant surfactant in the claimed drag reducing agent differs from that of Hellsten in both of the type of zwitterionic surfactant (acyl containing) and the amount of carbon atoms in the acyl group (12-16).

Further, the drag reducing agent composition of the invention requires a 10-70% of a second zwitterionic surfactant of having an acyl group (selection) with 18-22 carbon atoms (selection). This is purposeful, as the Examples in the present application demonstrate.

Finally, the **only** Example of Hellsten disclosing an experiment with sea-water (i.e., electrolyte containing) is Example 1. The **only** zwitterionic surfactant used in this Example is of the type  $RN^+(CH_3)(CH_3)CH_2COO^-$ , where R is an alkyl group having 16 carbon atoms, which is **different** from the present invention. Further, the zwitterionic surfactant is present in an amount of 1075 ppm and the anionic compound is present in an amount of 165 ppm. The total amount of these two compounds is thus **much higher** than the amount stated in, for example, claim 11 of the present invention (which is 50-400 ppm).

Other than conclusory statements, the examiner has failed to substantiate why one of ordinary skill in the art would have thought it obvious from Hellsten's disclosure to arrive at a drag-reducing agent containing **two different zwitterionic surfactants** (a and b) of specific formula and an **anionic** surfactant of the specific formula (c), the weight of a), b) and c) being 20-95% by weight, 10-70% by weight and 1-50% by weight, respectively, based on the total amount of a), b) and c) as claimed by present claim 1. The present rejection is therefore believed to be unsupported, and, in any event, absent hindsight, Hellsten cannot reasonably be interpreted as rendering claim 1 of the invention obvious under 35 U.S.C. §103.

Claim 2 – 5 and 19 are believed to be patentable over Hellsten et al for at least the same reasons as claim 1

Claim 8 claims injection water for the treatment of oil reservoirs, wherein said water contains a drag reducing agent containing two different zwitterionic surfactants (a and b) of specific formula and an anionic surfactant of the specific formula (c), the weight of a), b) and c) being 20-95% by weight, 10-70% by weight and 1-50% by weight, respectively, the total amount of a), b) and c) is from 50-400 ppm and said injection water in the absence of said drag reducing agent has an electrolyte content of 0.01-7% by weight. Hellsten clearly does not disclose, not does Hellsten render the invention of claim 8 obvious under 35 U.S.C. §103.

Claims 9 and 20 are patentable over Hellsten for at least the same reasons as claim 8.

Claim 11 claims a method of reducing drag in waters containing electrolytes which comprises adding to said waters containing said electrolytes at least one drag-reducing agent containing two different zwitterionic surfactants (a and b) of specific formula and an anionic surfactant of the specific formula (c), the weight of a), b) and c) being 20-95% by weight, 10-70% by weight and 1-50% by weight, respectively, based on the total amount of a), b) and c), or a mixture thereof; wherein the total amount of components a), b) and c) is from 50-400 ppm and said water in the absence of said drag reducing agent and said water has an electrolyte content of 0.01-7% by weight. Hellsten clearly does not disclose, not does Hellsten render the invention of claim 11 obvious under 35 U.S.C. §103.

Claim 12 – 16 and 21 are patentable over Hellsten for at least the same reasons as claim 11.

In further support of the claimed invention, Appellants also argued the unexpectedly superior results of the claimed invention compared to the closest embodiments disclosed by Hellsten. The examiner's position is that Appellants have

not demonstrated synergy commensurate in scope with the claims. Appellants disagree.

*Initially, it appears that the examiner has failed to indicate if the showing is sufficient to overcome the rejection of the embodiments tested. This information is certainly important and beneficial for both Appellants and the Honorable Board to know in evaluating the current rejection. Accordingly, the examiner is respectfully requested to clarify on the record if synergy is demonstrated **for the embodiments tested**.*

**\*\*** If no, a detailed explanation is respectfully requested regarding the basis or support for such a conclusion regarding the tested embodiments since this was clearly not provided for in the latest Advisory Action.

**\*\*** If yes, then it is an obligation of the examiner to identify those claims, or portions thereof, which would be allowable if amended to remove those portions allegedly not deemed to be supported by Appellants' showing. This is also not provided in the latest Advisory Action.

Additionally, the examiner alleges the following:

Appellants' asserted single comparative example is not sufficient evidence commensurate in scope with the claims. Hellsten et al '784 clearly discloses and teaches the broader subject matter instantly claimed, which applicants have failed to show unexpected results. This is not deemed persuasive because the evidence in support of the prima facie case of obviousness clearly outweighs said example.

Advisory Action mailed November 1, 2010, page 7, first full paragraph. Appellants respectfully submit that they have tested the claimed invention against the closest embodiment(s) specifically disclosed in Hellsten; it matters little how broad the Hellsten disclosure may be beyond the embodiments disclosed closest to the claimed invention. And, having tested the claimed invention against the closest disclosed embodiments in Hellsten, Appellants respectfully submit that they have provided a persuasive showing in support of the patentability of the claimed invention.

Concerning the showing that is a key part of this Appeal, Appellants provide the following summary for the benefit of the Honorable Board.

**1. Synergy is Demonstrated**

The Honorable Board is respectfully referred to Example 1 in the present application, specifically **Test 8, 2 and A of Example 1 (see below)**. In Example 1 the drag-reducing properties of different drag-reducing additives were evaluated in a synthetic sea-water containing 568 mmoles of chloride, 482 mmoles of sodium, 54 mmoles of magnesium, 28 mmoles of sulphate, 10 mmoles of calcium and 10 mmoles of potassium per liter water. In the evaluation test, 40 ml of the synthetic sea-water containing the drag-reducing additives were stirred in a 50 ml glass beaker with a magnetic stirrer at a constant speed of 700 r.p.m. and at different temperatures. The inner diameter of the beaker was 40 mm and the stirrer bar was 6 x 20 mm. The absence of a vortex in the water surface or a vortex of maximum 2 mm indicated a considerable reduction of the drag. Without addition of a drag-reducing agent, the vortex was 30 mm.

Test 8 is according to the invention, while tests 2 and A are comparative examples. The high upper level of 60°C reached by the combination of the betaines used in test 2 and test A, is not achieved by either test 2 or test A alone, i.e., the combination of the betaines in test 2 and test A yields a synergistically high upper level and not just an additive effect.

**Test 8** is according to the present invention and the components are C14APB (100 ppm), C18APB (100 ppm) and C12S (20 ppm)<sup>2</sup>.

**Test 2** (comparative example) uses only C14APB (200 ppm) and C12S (30 ppm).

---

<sup>2</sup> **C14APB** is a compound of formula I, where R<sub>1</sub> is a C<sub>14</sub> acyl, R<sub>3</sub> and R<sub>4</sub> are methyl and R<sub>5</sub> is methylene; **C18APB** is a compound of formula II, where R<sub>1</sub> is a C<sub>18</sub> acyl derived from oleic acid, R<sub>3</sub> and R<sub>4</sub> are methyl and R<sub>5</sub> is a methylene; and **C12S** is lauryl sulphate

**Test A** (comparative example) uses only C18APB (200 ppm) and C12S (20 ppm).

In **Test 8** the temperature range (14°C – 60°C) has a span of 46°C; lowest value 14°C, and highest value 60°C.

In **Test 2** the temperature range (16°C – 46°C) has a span of 30°C; lowest value 16°C, and highest value 46°C.

In **Test A** the temperature range (27°C – 49°C) has a span of 22°C; lowest value 27°C, and highest value 49°C.

Thus, the highest value of the temperature range in test 8 is 60°C, in test 2 it is 46°C and in test A it is 49°C. If the results of test 8 were merely additive, one would expect that the highest level of the temperature range for test 8 would only have been 49°C, not 60°C as was actually found. Similarly, the lowest value for test 8 would have been 16°C, not 14°C. Consequently both the highest and the lowest value of the range as well as the span of the range is synergistically affected by using a combination of components as presently claimed in the amounts claimed. This is surprising, completely unexpected, and could not be predicted from the Hellsten disclosure.

## **2. Cited Art Does Not Teach or Suggest Synergistic Effect.**

The synergistic effect of the claimed invention clearly **could not have been foreseen** by testing the separate components. There appears to be no record or evidence in the cited art teaching or suggesting the enhanced drag reducing effect of the invention, and certainly this effect could not have been predicted from the drag reducing properties of the individual components of the claimed combination. As such, the efficacy of the claimed combination is "surprising" and "unexpected", and Appellants respectfully submit that such data persuasively rebut the alleged case of obviousness presented by the examiner. Additionally, such data can reasonably be extrapolated to



the full scope of the Appellants' claims to the extent necessary to adequately distinguish over Hellsten. As such, Appellants' respectfully submit that the showing is persuasive and commensurate in scope with the claimed invention.

In view of the arguments presented herein, Appellants respectfully submit that the examiner has failed to establish a prima facie case of obviousness, or in the alternative, Applicants have clearly demonstrated the unexpected results of the claimed invention compared to the closest embodiments of Hellsten commensurate in scope with the claimed invention. The subject rejection is therefore believed to be improper and/or has been overcome. Reconsideration and withdrawal thereof is respectfully requested.

In view of the arguments presented herein Appellants respectfully submit that the pending claims stand improperly rejected. The Honorable Board is therefore respectfully requested to reverse the examiner and pass all of the pending claims to issue.

Respectfully submitted,



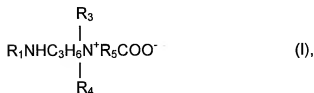
Ralph J. Mancini  
Attorney for Appellants  
Registration No. 34,054

Akzo Nobel Inc.  
Legal, IP & Compliance  
120 White Plains Road, Suite 300  
Tarrytown, NY 10591  
(914) 333-74

## IX. CLAIMS APPENDIX

1. A drag-reducing agent containing

a) a zwitterionic surfactant of the formula

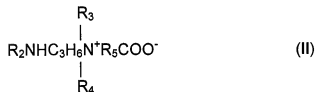


where  $\text{R}_1$  is an acyl group with 12-16 carbon atoms,  $\text{R}_3$  and  $\text{R}_4$  are independently of each other an alkyl group of 1-4 carbon atoms or an hydroxyalkyl group of 2-4 carbon atoms and  $\text{R}_5$  is an alkylene group of 1-4 carbon atoms, or a group



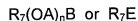
where  $\text{R}_6$  is an alkyl group of 1-3 carbon atoms,

b) a zwitterionic surfactant of the formula



where  $\text{R}_2$  is an acyl group with 18-22 carbon atoms, and  $\text{R}_3$ ,  $\text{R}_4$  and  $\text{R}_5$  have the meanings mentioned above, and

c) an anionic surfactant of the formulae



or a mixture thereof, where  $\text{R}_7$  is an aliphatic group of 8-14 carbon atoms, A is an alkylene group having 2-4 carbon atoms, n is a number from 1 to 10, B is a sulphate group  $\text{OSO}_3\text{M}$ , E is a sulphate group  $\text{OSO}_3\text{M}$  or a sulphonate group  $-\text{SO}_3\text{M}$  and M is a cationic, preferably monovalent group;

the weight of a), b) and c) being 20-95% by weight, 10-70% by weight and 1-50% by weight, respectively, based on the total amount of a), b) and c).

2. The drag reducing agent claim 1, wherein the component a) is present in an amount of 20-85% by weight.
3. The drag reducing agent of claim 1 wherein  $R_2$  contains at least 50% by weight of unsaturated acyl groups.
4. The drag reducing agent of claim 3, wherein  $R_2$  contains at least 20% by weight of unsaturated acyl groups having two or more double bonds.
5. The drag reducing agent of claim 1, wherein c) is lauryl sulphate, a lauryl (oxyethylene)<sub>n</sub> sulphate, where n is 1-3, or lauryl sulphonate.
8. Injection water for the treatment of oil reservoirs, wherein said water contains a drag reducing agent comprising:

a) a zwitterionic surfactant of the formula

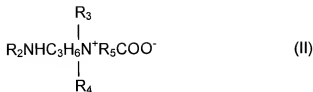


where  $R_1$  is acyl group with 12-16 carbon atoms,  $R_3$  and  $R_4$  are independently of each other an alkyl group of 1-4 carbon atoms or an hydroxyalkyl group of 2-4 carbon atoms and  $R_5$  is an alkylene group of 1-4 carbon atoms, or a group



where  $R_6$  is an alkyl group of 1-3 carbon atoms,

c) a zwitterionic surfactant of the formula



where  $\text{R}_2$  is an acyl group with 18-22 carbon atoms, and  $\text{R}_3$ ,  $\text{R}_4$  and  $\text{R}_5$  have the meanings mentioned above, and

c) an anionic surfactant of the formulae



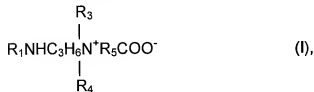
or a mixture thereof, where  $\text{R}_7$  is an aliphatic group of 8-14 carbon atoms, A is an alkylene group having 2-4 carbon atoms, n is a number from 1 to 10, B is a sulphate group  $\text{OSO}_3\text{M}$ , E is a sulphate group  $\text{OSO}_3\text{M}$  or a sulphonate group  $-\text{SO}_3\text{M}$  and M is a cationic, preferably monovalent group; wherein the weights of components a), b) and c) are 20-95% by weight, 10-70% by weight and 1-50% by weight, respectively, based on the total amount of a), b) and c), which is from 50-400 ppm and said water in the absence of said drag reducing agent has an electrolyte content of 0.01-7% by weight.

9. Injection water according to claim 8, wherein said water contains electrolytes in an amount of 0.3-6% by weight.

10. Injection water according to claim 8 wherein the water is sea-water or production water.

11. A new method of reducing drag in waters containing electrolytes which comprises adding to said waters containing said electrolytes at least one drag-reducing agent containing

a) a zwitterionic surfactant of the formula

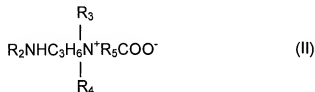


where  $R_1$  is acyl group with 12-16 carbon atoms,  $R_3$  and  $R_4$  are independently of each other an alkyl group of 1-4 carbon atoms or an hydroxyalkyl group of 2-4 carbon atoms and  $R_5$  is an alkylene group of 1-4 carbon atoms, or a group



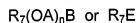
where  $R_6$  is an alkyl group of 1-3 carbon atoms,

b) a zwitterionic surfactant of the formula



where  $R_2$  is an acyl group with 18-22 carbon atoms, and  $R_3$ ,  $R_4$  and  $R_5$  have the meanings mentioned above, and

c) an anionic surfactant of the formulae



or a mixture thereof, where  $R_7$  is an aliphatic group of 8-14 carbon atoms, A is an alkylene group having 2-4 carbon atoms, n is a number from 1 to 10, B is a sulphate group  $OSO_3M$ , E is a sulphate group  $OSO_3M$  or a sulphonate group  $-SO_3M$  and M is a cationic, preferably monovalent group;

the weight of a), b) and c) being 20-95% by weight, 10-70% by weight and 1-50% by weight, respectively, based on the total amount of a), b) and c); wherein the total amount of components a), b) and c) is from 50-400 ppm and said water in the absence of said drag reducing agent has an electrolyte content of 0.01-7% by weight.

12. The new method of claim 11, wherein the component a) and b) are present in an amount of 20-85% by weight and 10-70% by weight, respectively.

13. The method of claim 11 wherein  $R_2$  contains at least 50% by weight of unsaturated acyl groups.

14. The method of claim 11 wherein  $R_2$  contains at least 20% by weight of unsaturated acyl groups having two or more double bonds.
15. The method of claim 11 wherein c) is lauryl sulphate, a lauryl (oxyethylene) $_n$  sulphate, where n is 1-3, or lauryl sulphonate.
16. The method of claim 11 wherein the water has an electrolyte content of 0.3-6% by weight.
19. The drag reducing agent claim 1, wherein  $R_5$  is  $CH_2$ .
20. Injection water according to claim 8, wherein  $R_5$  is  $CH_2$ .
21. The method of claim 11, wherein  $R_5$  is  $CH_2$ .

X. EVIDENCE APPENDIX

None.

XI. RELATED PROCEEDINGS APPENDIX

None.